AMENDMENT TO THE TITLE

Please replace the original title with following rewritten title.

CODING MODE DETERMINDING APPARATUS, IMAGE CODING APPARATUS, CODING MODE DETERMINGING METHOD AND CODING MODE DETERMINING PROGRAM ~~ENCODING MODE DECIDING APPARATUS, IMAGE ENCODING APPARATUS, ENCODING MODE DECIDING METHOD, AND ENCODING MODE DECIDING PROGRAM~~

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph beginning on page 3, line 9 as follows:

Here, at the time of selecting the reference picture and the division method for the image block for each of the small blocks, an amount called "coding cost" is used. The coding cost is an amount represented by the sum of the pixel differential value, ~~the degree of deterioration of an image~~ (the sum of the absolute difference between small blocks and predicted image) and the code amount of motion information (e.g., motion vector or differential motion vector), and a smaller coding cost of each image block indicates a better coding efficiency of the image block. Further, the sum of the squared differences, or the sum of the absolute values of errors after performing Hadamard transform or DCT transform on the difference is sometimes used, instead of the sum of the absolute difference.

Please amend the paragraph beginning on page 11, line 4 as follows:

The coding cost is represented, for example, by the sum of the pixel differential value, ~~the degree of deterioration of an image~~ (the sum of the absolute difference between a small block and a reference picture in motion estimation) and the code amount of motion information (e.g., motion vector or differential motion vector). The coding mode is, for example, the division method for the small block, the picture reference direction during motion estimation for the small block, or the coding picture structure of the small block.

Please amend the paragraph beginning on page 23, line 20 as follows:

In an image coding apparatus according to claim 29, in claim 28, the complex motion estimation, ~~prediction~~ portion performs complex inter prediction or complex intra prediction on each block having the determined coding picture structure.

Please amend the paragraph beginning on page 46, line 11 as follows:

On the other hand, when the small block full-pel prediction step S45 and the prediction direction selecting step S46 are performed in series for each of the small blocks (see Fig. 8(b)), the process for the small block Sb2 is performed first, and then the

process for the small block Sb3 is performed. That is, the forward prediction step S452', the backward prediction step S456' and the small block prediction method selecting step S462' are performed for the small block Sb2 first. Thereafter, the forward prediction step S452", the backward prediction step S456" and the small block prediction method selecting step S462" are performed for the small block Sb3. In this case, the process for each of the small blocks may also be performed in parallel, as described under (1-2). For example, the forward prediction step S452", the backward prediction step S456"and the small block prediction method selecting step S462" may be performed in parallel for the small block ~~1~~ Sb3.

Please amend the paragraph beginning on page 47, line 20 as follows:

The coding cost converting step S66 separately converts each of the coding costs obtained by the forward prediction steps S451 to S454 and the coding costs obtained by the backward prediction steps S455 to S458 into a coding cost per image block. Specifically, the coding cost converted for each image block is a value obtained by multiplying the coding cost for each prediction method ~~code~~ of each small block that is obtained by the small block full-pel prediction step S45, by the number of divisions of the partition concerned.

Please amend the paragraph beginning on page 48, line 16 as follows:

The coding cost converting step S66 separately converts each of the coding costs obtained by the forward prediction steps S451 to S454 and the coding costs obtained by the backward prediction steps S455 to S458 into a coding cost per image block. Specifically, the coding costs of fw, bw and bid of Sb1 are multiplied by one, the coding costs of fw, bw and bid of Sb2 to Sb5 are multiplied by two, and the coding costs of ~~FW~~ fw, bw and bid of Sb6 to Sb9 are multiplied by four.

Please amend the paragraph beginning on page 55, line 19 as follows:

If it is determined that there is no margin for processing, then a single prediction direction that is determined to exhibit the smallest coding cost based on full-pel prediction is selected for each of the small blocks (step ~~S55~~ S35), the necessary

processing amounts for the respective small blocks are summed up for each candidate division method, and the necessary processing amount for the candidate division method is calculated (step S35). For example, for the small blocks Sb2 and Sb3 of 16×8, necessary processing amounts of [2] of the small block Sb2 and Sb3 per prediction direction are summed up, and the necessary processing amount for the 16×8 candidate division method is calculated as [4]. The calculated necessary processing amount is compared with the margin for the processing amount set in the step S30, and, if the necessary processing amount is smaller than the margin for the processing amount, then it is determined that there is a margin for processing (step S36).

Please amend the paragraph beginning on page 57, line 13 as follows:

The calculated necessary processing amount [4] is compared with the margin for the processing amount [8] set in the step ~~S50~~ S30, and it is determined that there is a margin for processing, since the necessary processing amount [4] is not larger than the margin for the processing amount [8] (step S32).

Please amend the paragraph beginning on page 59, line 7 as follows:

First, the 16×16 division method (coding cost (40)) is subjected to the process. Specifically, in the 16×16 division method, the prediction direction of sub-pel prediction on the small block Sb1 is selected with the method described under (3-1) first. This is the first case, in which the coding cost of the forward prediction fw and the coding cost of the backward prediction bw substantially match. Therefore, motion estimation with non-integer pixel accuracy is performed for the two types of prediction directions of the forward prediction fw and the backward prediction bw. As a result, a necessary processing amount of [4] for sub-pel prediction on the forward prediction fw for the small block Sb1 and a necessary processing amount of [4] for sub-pel prediction for the backward ~~forward~~ prediction bw on the small block Sb1 are estimated. The estimated necessary processing amounts [4] for the small block Sb1 are summed up for each candidate division method, and a necessary processing amount of [8] for the candidate division method is calculated (step S31).

Please amend the paragraph beginning on page 61, line 21 as follows:

More specifically, "complex motion estimation" refers to motion estimation that is more complex than a simple motion estimation. For example, the complex motion estimation may be motion estimation with a finer accuracy (e.g., non-integer pixel accuracy such as 1/2 pixel accuracy and 1/4 pixel accuracy) as compared to a simple motion estimation with integer pixel accuracy, motion estimation with a finer accuracy as compared to a ~~non-integer pixel~~ simple motion estimation with non-integer pixel accuracy, or motion estimation in which a finer image is referenced as compared to a simple motion estimation in which a reduced image (image from which pixel information has been culled) is referenced.

Please amend the paragraph beginning on page 66, line 7 as follows:

The intra prediction portion 61 is controlled by a control portion (not shown), and performs intra prediction on a block (a field structure block or a frame structure block) having the picture structure determined by a coding picture structure determining portion 67. As a result, the intra prediction portion 61 performs intra prediction of the input image signal 30 for each image block, and outputs a result of the intra prediction to the switching portion 64.

Please amend the paragraph beginning on page 66, line 14 as follows:

The inter prediction portion 62 receives the input image signal 30 as a first input and the local decoded signal 32 as a second input, and outputs a result of the inter prediction to the switching portion 64. Furthermore, the inter prediction portion 62 outputs, as a second output, information relating to coding, such as the motion vector, of the inter prediction result to the coding portion 5.

Please amend the paragraph beginning on page 66, line 20 as follows:

The inter prediction portion 62 ~~3~~ includes: a motion estimation portion 65 that receives the input image signal 30 as a first input and the local decoded signal 32 as a second input and that performs motion estimation; a predicted image generating portion 11 that receives an output from the motion estimation portion 65 as a first input and the

local decoded signal 32 as a second input and that outputs a predicted image; and a subtractor 12 that receives the input image signal 30 as a first input and an output from the predicted image generating portion 11 as a second input. The motion estimation portion 65 performs motion estimation to derive a coding cost. Further, of the output from the motion estimation portion 65, coding information such as the motion vector or the coding mode is also supplied to an input to a variable length coding portion 22.

Please amend the paragraph beginning on page 67, line 4 as follows:

The switching portion 64 receives a result of the intra prediction as a first input and a result of the inter prediction as a second input, and outputs one of the inputs to the coding portion 5, in accordance with a switch signal from the coding mode determining portion 63.

Please amend the paragraph beginning on page 67, line 12 as follows:

The coding mode determining portion 63 includes a coding picture structure determining portion 67 and an intra/inter selecting ~~determining~~ portion 68. The coding picture structure determining portion 67 receives the coding cost information from the motion estimation portion 65 as an input. The coding picture structure determining portion 67 sums up the coding costs for the top and the bottom of each of the coding picture structures to determine the coding picture structure. The coding picture structure determining portion 67 outputs the determined coding picture structure to the intra/inter selecting portion 68.

Please amend heading on page 73, line 10 as follows:

<Configuration of encoder ~~1~~ 90 >

Please amend the paragraph beginning on page 73, line 14 as follows:

An encoder ~~60~~ 90 shown in Fig. 19 includes: an intra prediction portion 91 that performs intra prediction of an input image signal 30; an inter prediction portion 92 that performs inter prediction of the input image signal 30; a coding mode determining portion 93; a switching portion 94 that switches between a prediction result of intra prediction and a prediction result of inter prediction; a coding portion 5 that codes an

output from the switching portion 94 and outputs a coded image signal 31; and a reference image generating portion 6 that generates a local decoded signal 32 of the input image signal 30.